DISCUSSION OF THE CLAIMS

Claims 1-19 are pending in the present application. Claims 8-15 are presently withdrawn from active prosecution. Claims 16-19 are new claims. Support for new Claims 16-19 is found in the examples of the present specification (see for example Table 1 and the legend thereto).

No new matter is added.

REMARKS/ARGUMENTS

Present independent Claims 1 and 5 are drawn to catalyst compositions. The claimed catalyst compositions require the inclusion of a quaternary ammonium salt (A) and either or both of a hydrophobic amine compound (B) and a heterocyclic tertiary amine compound (see Claims 1 and 5, respectively). Applicants have shown in the examples of the specification that the claimed catalyst which includes a mixture of different materials, provides substantially improved polyol hydrolysis resistance and thus improved stability of a urethane raw material and/or improved properties of the resultant urethane foam.

Applicants draw the Office's attention to Table 1 of the specification which describes a series of inventive catalyst compositions. Examples 1 and 7-8 are inventive examples encompassed by present Claim 1. The bottom portion of Table 1 provides the catalysis effect and performance of the inventive examples.

TABLE 1

	Example									
	1	2	3	4	5	6	7	8	9	10
Isocyanate Index	200	200	200	200	200	200	200	200	200	200
Initial Reactivity GT (second)	30	31	30	30	29	32	30	32	29	33
Reactivity after storage GT (second)	31	31	30	30	29	32	31	33	30	35
GT change ratio (%)	3.3	0.0	0.0	0.0	0.0	0.0	3.3	3.0	3.4	6.0
Core density (kg/m^3)	28.1	27.9	27.8	28.4	28.0	28.6	28.1	27.4	27.6	28.9
Flowability (cm)	82.6	74.1	73.6	73.9	74.5	77.2	81.6	83.3	80.4	78.5
Dimensional stability (%)	−0.5	−0.3	−0.6	−0.2	−0.4	−0.9	−0.4	−0.6	−0.4	−0.4
Adhesive strength (kg/cm^2)	1.5	2.1	2.2	2.4	2.5	2.0	1.6	1.6	2.2	1.8

Table 2 of the specification describes a series of comparative examples that do not meet the requirements of one or more of Claims 1 and 5. The bottom portion of Table 2 provides the catalysis effect and performance of the comparative examples.

TABLE 2

	Comparative Example									
	1	2	3	4	5	6	7	8	9	10
Isocyanate Indx	200	200	200	200	200	200	200	200	200	200
Initial Reactivity GT (second)	30	28	30	30	28	28	28	28	28	28
Reactivity after storage GT (second)	41	64	42	42	41	56	57	31	36	36
GT change ratio (%)	36.7	128.6	40.0	40.0	46.4	100.0	103.6	10.7	28.6	28.6
Core density (kg/m^3)	32.4	32.4	32.9	28.4	27.8	32.4	28.4	28.3	27.9	32.4
Flowability (cm)	69.9	67.8	69.9	78.8	74.7	64.7	74.1	80.9	74.5	64.8

Dimensional stability (%)	-0.5	-4.2	-1.2	-4.3	-1.2	-1.3	-1.5	-0.9	-0.9	-0.9
Adhesive strength (kg/cm^2)	1.1	0.3	0.8	0.6	1.5	0.6	0.6	1.6	0.6	0.9

Comparative Example 8 may be compared with inventive Example 1. Both of Comparative Example 8 and inventive Example 1 include the same quaternary ammonium salt catalyst (i.e., catalyst A1 = tetraethylammonium acetate). Comparative Example 8 actually includes a greater amount of the quaternary ammonium salt that is present in inventive Example 1. Even though the comparative example includes a greater relative amount of catalyst, the comparative example provides a raw material mixture that has inferior reactivity and stability properties. In fact, as is shown in Tables 1 and 2 of the specification, Comparative Example 8 which contains only the quaternary ammonium compound (A) and not the hydrophobic amine compound (B) (see the complete tables in the patent), provides a raw material mixture that has lower reactivity after storage and has an inferior GT changing rate. The foam made from a raw material mixture that comprises the catalyst of Claim 1 has improved core density, fluidity, dimensional stability and adhesive strength.

Applicants thus submit that the original specification includes factual evidence rebutting the Office's assertion of obviousness; namely, the original specification includes a description of examples which prove that using a mixture of a quaternary ammonium compound *and* a hydrophobic amine compound provides a catalyst having superior properties and/or provides a urethane material having superior properties.

Tables 1 and 2 likewise provide evidence that mixtures comprising the quaternary ammonium compound (A) and the heterocyclic tertiary amine compound (C) are superior to catalyst compositions that contains only one of the compounds recited in Claim 5. Each of Examples 2-6 of Table 1 is encompassed by present Claim 5 and includes both the quaternary ammonium compound (A) and the heterocyclic tertiary amine compound (C). Comparative Example 8 of Table 2 on the other hand describes a catalyst composition that contains only the quaternary ammonium compound (A). The raw material mixture and foam derived from

the inventive examples is superior to the raw material mixture and resulting foam derived from Comparative Example 8. This is evident, for example, in the adhesion property and reactivity characteristics of the inventive compositions in comparison to Comparative Example 8.

Applicants thus submit that the examples and comparative examples of the original specification rebut the Office's assertion that the subject matter of Claim 5 is obvious.

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The Office asserts that the claimed subject matter is obvious over the combination of Zama (U.S. 5,171,787) and Decker (U.S. 5,997,954). Applicants submit that not only are the claims non-obvious for the reasons discussed above, e.g., the substantial improvement in catalyst performance when a mixture of (A) and (B)/(C) is used instead of only a single catalyst, but further for the reason that the art cited by the Office is directed to subject matter substantially different from the presently claimed invention.

With respect to Zama Applicants note that the cited art discloses compositions having effects that are contrary to the effects observed for the presently claimed invention. In particular, Applicants disclose that the catalyst of the present claims is able to inhibit the hydrolysis of polyester polyols in raw material blends used for preparing urethanes. Paragraph [00167] of the PG publication corresponding with the present application (i.e., U.S. 2007/0112085) discloses the following in this regard:

> The present invention has been made in view of the above problems, and objects thereof are to provide a catalyst composition capable of enhancing storage stability of a raw material-blended composition containing water or a blowing agent composed of water and specific HC and/or HFC, and a polyester polyol by inhibiting the hydrolysis of the polyester polyol in the raw material-blended composition, ...

Zama discloses a composition which includes improved hydrolytic properties:

> ...a heavy metal compound, amine, or quaternary ammonium salt (C) which catalyzes the hydrolysis and condensation reactions, and allowing the resulting formulation to undergo hydrolysis and condensation reactions...

See the Abstract of Zama.

Applicants submit that those of ordinary skill in the art would not turn to Zama as inspiration for making a catalyst composition that *inhibits* hydrolysis of a raw material mixture used for preparing a urethane. For at least this reason, Applicants submit that the rejection of the claims in view of Zama, alone or in combination with Decker, should be withdrawn.

The Office appears to take the position that the presently claimed invention is obvious because Zama describes that mixtures of a wide variety of components may be used as catalysts. Applicants note, however, that Zama exemplifies only those catalyst compositions which contain a single catalyst component. Zama nowhere discloses or suggests that improved catalyst performance and/or improved urethane products are in any way related to using a mixture of catalyst materials. As discussed above, Applicants have shown in the examples of the present specification that mixtures of materials such as a quaternary ammonium salt (A) and either or both of a hydrophobic amine compound (B) and a heterocyclic tertiary amine compound (C), provide substantially improved performance in comparison to catalyst compositions that contain only a quaternary ammonium salt.

Further still, Applicants point out that Zama is drawn to catalyst compositions used to form certain silicone-based composite rubber compositions. Applicants submit that those of skill in the art would have no basis for believing that the catalyst of Zama is also useful or desirable for use in catalyzing formation of rigid polyurethane foams and/or isocyanurate-modified rigid polyurethane foams. With respect to the rejection of Claim 5 over Zama in combination with Decker, Applicants again draw the Office's attention to the examples of the specification which demonstrate that substantially improved catalytic performance is

obtained when a catalyst composition contains mixtures of the components (A) and (B) and/or (A) and (C).

Applicants submit that the examples of the present specification are probative of the nonobviousness of the claimed invention and respectfully request withdrawal of the rejection.

Zama does not disclose or suggest that any improved catalytic performance may be obtained by using a combination and/or mixture of the quaternary ammonium salt (A) and the heterocyclic tertiary amine (C) of present Claim 5. Decker like Zama describes a catalyst that encourages hydrolysis (see column 4, lines 27-35 of Decker). As explained above for Zama, those of skill in the art would not be motivated by the disclosure of the hydrolysis-advantaged catalysts of Decker as inspiration to make the catalyst compositions of the present claims which protect polyester polyols from undesired hydrolysis.

For the reasons discussed above in detail, Applicants submit that withdrawal of the rejections and the allowance of all now-pending claims is appropriate.

Respectfully submitted,

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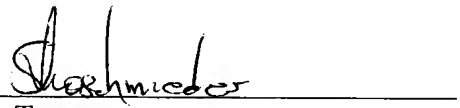

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